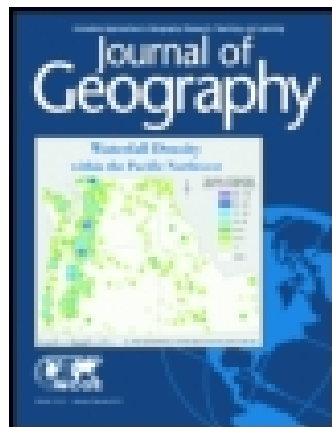


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Public radio programming: An opportunity for geographic educators

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The real significance of a barrel of crude oil lies in the products our refineries can make from it. In 1974 almost 60 percent was refined into gasoline and jet and diesel fuel.¹⁶ Even that was not enough to satisfy our demand; in that year we imported 61 million barrels.¹⁷ As long as we depend on internal combustion engines to move automobiles, trucks, buses, and planes, we will be unable to significantly reduce our huge consumption of petroleum without crippling our economy.

Somehow, we must phase out petroleum as a dominant source of fuel. Perhaps the only way to do it, without disrupting our vital highway transportation system, is to devise and promptly put to use an acceptable electric substitute for the internal combustion engine. This might be a battery capable of moving a motor vehicle as fast and far as a tankful of gasoline or diesel oil and of being replaced quickly on depletion at thousands of convenient service stations. Incidentally, a major reduction in air pollution would result from discontinued automobile emissions.

Electricity can replace fuel and diesel oil for domestic, commercial, and industrial heat and power and for running locomotives. Nuclear reactors can generate electricity to propel ships. The petrochemical industry can continue to provide us with such products as plastics, synthetic rubber, synthetic fibers, dyes, and drugs from more abundant or replaceable materials, such as coal, grain, molasses, and wood.¹⁸

Natural gas is so clean, efficient, and easy to transport that it is by far the best of the fossil fuels. Accordingly, we rely on it for nearly one-third of our energy (table 1). This too must end because we cannot afford to spend huge sums of money to import gas. In the meantime, however, the use of natural gas should be increased in such a way as to contribute to decreases in petroleum imports. Also, its continued use for domestic heating and cooking will be temporarily necessary in order to give householders time to prepare for the inevitable change to electricity, perhaps supplemented by solar heat. All other users should convert to nuclear electricity at the earliest

practicable date. This shift from gas to electricity should be second in urgency only to a change from petroleum to electricity.

A NATIONAL ENERGY PROGRAM

The United States can and must adopt and implement a national energy program. Salient elements of this program should be:

1. Achieving domestic energy self-sufficiency at more than our current level of consumption as soon as possible, but no later than ten years hence.
2. Accomplishing this by substituting nuclear electricity for petroleum and natural gas as our major energy source. Initially, we should provide this electricity by new fission reactors, with storage for their waste as safe as we know how to make it.
3. Initiating an immediate full-scale program to produce practical fusion reactors to replace fission reactors.
4. Speeding the development and use of an efficient, economical, and convenient electrical means of propelling motor vehicles that can replace, and perhaps improve upon, the internal combustion engine.
5. Reducing substantially imports of petroleum and natural gas as fast as possible during the difficult period of transition to electricity. This may be accomplished by increasing domestic production to the ultimate level by encouraging onshore and offshore drilling and by raising domestic prices to the prevailing world level. Also, we must strive to increase the amount of gasoline derived from a barrel of crude oil.
6. Conducting substantial research on any exotic energy source that shows promise of becoming more economically and environmentally desirable than fusion reactors.

CONCLUSION

Our current energy crisis is devastating only if we allow it to be. Would it not be better to turn our current problems into an opportunity to assure a more abundant future for ourselves and all mankind? Forty years ago, nuclear power was unavailable. Forty years from now, we may be relying on energy sources not even dreamed of today. Indeed, the prospect for more power to America looks very bright.

MEDIA REVIEW

GEORGE O. CARNEY

Public radio programming: an opportunity for geographic educators

National Public Radio (NPR) is this country's only nationwide connected public radio system. Serving communities in 48 states, Puerto Rico, and the District of Columbia, NPR is composed of 167 licensees operating 211 noncommercial public radio stations. A keystone of NPR philosophy and operating policy is the practice of seeking decentralized sources of program materials. NPR acquires and distributes programs and reports supplied by the staffs of member

stations, independent producers and reporters, and foreign broadcasting agencies such as the British Broadcasting Corporation, the Canadian Broadcasting Corporation, and Radio Nederland.

National Public Radio operates a "two-way system" by gathering the sounds of life and land from productions by their member stations and sending them out across the country. Local programming is geared toward the interests of each

distinct community; therefore, local listeners hear programs in the Navajo language from Ramah, New Mexico, or in Eskimo dialects from Kotzebue, Alaska. Partially funded by local listeners, many of the NPR stations also receive federal tax dollars from the Corporation for Public Broadcasting. NPR is therefore responsible and responsive to local people.

Local NPR affiliates provide an opportunity for geographic educators at all levels of instruction to become involved in local programming. Public radio staffs are interested in developing local programs. Perhaps you have a unique classroom experience that you would like to share with the local community, or maybe you have an instructional innovation that would be of interest to the public listener.

There are countless possibilities for the geographic educator who would like to improve the image of geography in his or her community or who would merely like to make geographic education more visible to interested listeners. The venture costs nothing, if you, the classroom geography teacher, will only participate.

A list of National Public Radio member stations and their location on the radio band is provided for the geographic educator who desires to make contact. For more information, write to the National Association of Educational Broadcasters (NAEB), 1346 Connecticut Avenue, N.W., Washington, D.C. 20036.

The following are National Public Radio member stations:

ALABAMA									
Birmingham	WBHM (FM)	90.3	Edwardsville	WSIE (FM)	88.7	MINNESOTA			
Huntsville	WLRH (FM)	89.3	Peoria	WCBU (FM)	89.9	Collegeville	KSJR (FM)	90.1	
Mobile	WHIL-FM	91.3	Springfield	WSSR (FM)	91.9	Duluth	WSCD (FM)	92.9	
Troy	WTSU-FM	90.1	Urbana	WILL (AM)	580	Grand Rapids	KAXE-FM	91.7	
				WILL-FM	90.9	St. Paul	KSJN (FM)	91.1	
						Minneapolis	KUOM (AM)	770	
ALASKA			INDIANA			Moorhead	KCCM (FM)	91.1	
Bethel	KYUK (AM)	580	Bloomington	WFIU (FM)	103.7	Northfield	WCAL (AM)	770	
Dillingham	KDLG-AM	670	Indianapolis	WIAN (FM)	90.1		WCAL-FM	89.3	
Fairbanks	KUAC (FM)	104.7	Vincennes	WVUB (FM)	91.1	Pipestone	KRSW (FM)	91.7	
Juneau	KTOO-FM	104.3	West Lafayette	WBAA (AM)	920	Rushford	KLSE (FM)	91.7	
Kodiak	KMXT-FM	100.1							
Kotzebue	KOTZ (AM)	720				MISSISSIPPI			
			IOWA			Senatobia	WNJC (FM)	90.1	
ARIZONA			Ames	WOI (AM)	640				
Phoenix	KMCR (FM)	91.5		WOI (FM)	90.1	MISSOURI			
Tucson	KUAT (AM)	1550	Cedar Falls	KHKE (FM)	89.5	Buffalo	KBFL (FM)	90.3	
	KUAT-FM	90.5		KUNI (FM)	90.9	Columbia	KBIA (FM)	91.3	
Yuma	KAWC (AM)	1320	Cedar Rapids	KCCK-FM	88.3	Kansas City	KCUR (FM)	89.3	
			Iowa City	WSUI (AM)	910	Maryville	KXCV (FM)	90.5	
ARKANSAS				KSUI-FM	91.7	Point Lookout	KSOZ (FM)	91.7	
Jonesboro	KASU (FM)	91.9	Sioux City	KWIT-FM	90.3	Rolla	KUMR (FM)	88.5	
						Springfield	KSMU (FM)	91.1	
CALIFORNIA			KANSAS			St. Louis	KWMU (FM)	90.7	
Fresno	KVPR (FM)	89.3	Lawrence	KANU (FM)	91.5	Warrensburg	KCMW (FM)	90.9	
Long Beach	KLON (FM)	88.1	Manhattan	KSAC (AM)	580				
Los Angeles	KUSC (FM)	91.5	Wichita	KMUW (FM)	89.1	MONTANA			
Mission Viejo	KSBR (FM)	90.7				Missoula	KUFM (FM)	89.1	
Northridge	KCSN (FM)	88.5	KENTUCKY						
Pasadena	KPCS (FM)	89.3	Lexington	WBKY (FM)	91.3	NEBRASKA			
Sacramento	KERS		Louisville	WFPL (FM)	89.3	Omaha	KIOS (FM)	91.5	
San Bernardino	KVCR (FM)	91.9		WFPK (FM)	91.9		KVNO-FM	90.7	
San Diego	KPBS-FM	89.5	Morehead	WUOL (FM)	90.5				
San Francisco	KALW (FM)	91.7	Murray	WMKY (FM)	90.3	NEVADA			
	KQED-FM	88.5	Richmond	WKMS (FM)	91.3	Las Vegas	KNPR		
San Luis Obispo	KCBX (FM)	90.1		WEKU (FM)	88.9				
San Mateo	KCSM-FM	91.1	LOUISIANA			NEW JERSEY			
Santa Monica	KCRW (FM)	89.9	New Orleans	WWNO (FM)	89.9	Newark	WBGO (FM)	88.3	
Santa Rosa	KBBF (FM)	89.1							
Stockton	KUOP (FM)	91.3	MAINE			NEW MEXICO			
Thousand Oaks	KCPB (FM)	91.1	Bangor	WMEH (FM)	90.9	Albuquerque	KUNM (FM)	90.1	
			Portland	WMEA (FM)	90.1	Las Cruces	KRWG (FM)	90.7	
COLORADO			Presque Isle	WMEM-FM	106.1	Ramah	KTDB (FM)	89.7	
Boulder	KGNU-FM	88.5							
Denver	KCFR (FM)	90.1	MARYLAND			NEW YORK			
Fort Collins	KCSU-FM	90.9	Baltimore	WBJC (FM)	91.5	Albany	WAMC (FM)	90.3	
Greeley	KUNC (FM)	91.5		WEAA-FM	88.9	Binghamton	WSKG-FM	89.3	
			MASSACHUSETTS			Buffalo	WBFO (FM)	88.7	
CONNECTICUT			Amherst	WFCR (FM)	88.5		WEBR (AM)	970	
Hartford	WEDH-FM	90.5	Boston	WBUR (FM)	90.9	Canton	WNED-FM	94.5	
				WGBH-FM	89.7	New York City	WSLU (FM)	96.7	
DISTRICT OF COLUMBIA							WNYC (AM)	830	
	WAMU-FM	88.5					WNYC-FM	93.9	
	WETA-FM	90.9				Oswego	WRVO (FM)	89.9	
FLORIDA			MICHIGAN			Rochester	WXXI-FM	91.5	
Boynton Beach	WHRF (FM)	91.7	Alpena	WCML-FM	91.7	Schenectady	WMHT-FM	89.1	
Jacksonville	WJCT-FM	89.9	Ann Arbor	WUOM (FM)	91.7	Syracuse	WCNY-FM	91.3	
Miami	WLRN (FM)	91.3	Barren Springs	WAUS (FM)	90.9				
Panama City	WKGC (FM)	90.7	Detroit	WDET-FM	101.9	NORTH CAROLINA			
Tallahassee	WFSU-FM	91.5	East Lansing	WKAR (AM)	870	Chapel Hill	WUNC (FM)	91.5	
Tampa	WUSF-FM	89.7		WKAR-FM	90.5	Warrenton	WVSP-FM	90.9	
			Flint	WFBE (FM)	95.1	Winston-Salem	WFDD (FM)	88.5	
GEORGIA			Grand Rapids	WVGR (FM)	104.1				
Atlanta	WABE (FM)	90.1	Houghton	WGGL (FM)	91.1				
			Interlochen	WIAA (FM)	88.3	NORTH DAKOTA			
ILLINOIS			Kalamazoo	WMUK (FM)	102.1	Belcourt	KEYA-FM	88.5	
Carbondale	WSIU (FM)	91.9	Marquette	WNMU-FM	90.1	Fargo	KDSU (FM)	91.9	
Chicago	WBEZ (FM)	91.5	Mt. Pleasant	WCMU-FM	89.5	Grand Forks	KFJM (AM)	1370	
DeKalb	WNIU (FM)	89.5	Ypsilanti	WEMU-FM	89.1		KFJM-FM	89.3	

OHIO			PUERTO RICO			VERMONT		
Athens	WOUB (AM)	1340	Hato Rey	WIPR (AM)	940	Windsor	WVPA-FM	89.5
	WOUB-FM	91.3		WIPR-FM	91.3			
Cincinnati	WGUC (FM)	90.9				VIRGINIA		
Cleveland	WBOE-FM	90.3	SOUTH CAROLINA			Harrisonburg	WMRA (FM)	90.7
Columbus	WCBE (FM)	90.5	Charleston	WSCI (FM)	89.3	Norfolk	WTGM (FM)	89.5
	WOSU (AM)	820	Columbia	WLTR-FM	91.3	Richmond	WRFK (FM)	106.5
	WOSU-FM	89.7	Greenville	WEPR (FM)	90.1	Roanoke	WVWR (FM)	89.1
Kent	WKSU (FM)	89.7	Sumter	WMPR (FM)	88.1			
Oxford	WMUB-FM	88.5				WASHINGTON		
Toledo	WGTE-FM	91.3	SOUTH DAKOTA			Pullman	KWSU (AM)	1250
Wiberforce	WCSU (FM)	88.9	Brookings	KESD-FM	88.3	Seattle	KUOW (FM)	94.9
Yellow Springs	WYSO (FM)	91.5	Vermillion	KUSD (AM)	690	Tacoma	KTOY (FM)	91.7
Youngstown	WYSU (FM)	88.5		KUSD-FM	89.9			
			TENNESSEE			WEST VIRGINIA		
OKLAHOMA			Collegedale	WSMG (FM)	90.7	Beckley	WVPB (FM)	91.7
Stillwater	KOSU (FM)	91.7	Johnson City	WETS (FM)	89.5	Buckhannon	WVPW (FM)	88.9
Tulsa	KWGS-FM	89.5	Knoxville	WUOT (FM)	91.9			
			Memphis	WKNO-FM	91.1	WISCONSIN		
OREGON			Murfreesboro	WMOT (FM)	89.5	Auburndale	WLBL (AM)	930
Corvallis	KOAC (AM)	550	Nashville	WPLN (FM)	90.3	Brule	WWSA (FM)	89.9
Eugene	KLCC (FM)	90.3				Colfax	WHWC (FM)	88.3
	KWAX (FM)	91.1	TEXAS			Delafield	WHAD (FM)	90.7
Portland	KBOO (FM)	90.7	Austin	KUT (FM)	90.7	Green Bay	WPNE (FM)	89.3
	KBPS (AM)	1450	Beaumont	KVLU (FM)	91.3	Highland	WHHI (FM)	91.3
	KOAP-FM	91.5	College Station	KAMU (FM)	90.3	Kenosha	WGTD-FM	91.1
			Commerce	KETR (FM)	88.9	LaCrescent	WHLA (FM)	90.3
PENNSYLVANIA			Dallas	KERA-FM	90.1	LaCrosse	WLSU (FM)	88.9
Erie	KQLN-FM	91.3	El Paso	KTEP (FM)	88.5	Madison	WERN (FM)	88.7
Hershey	WITF-FM	89.5	Houston	KPFT-FM	90.1		WHA (AM)	970
Philadelphia	WUHY-FM	90.9	Killeen	KNCT (FM)	91.3	Milwaukee	WUWM (FM)	89.7
Pittsburgh	WDUQ (FM)	90.5				Wausau	WHRM (FM)	91.9
	WQED-FM	89.3	UTAH					
Scranton	WVIA-FM	89.9	Logan	KUSU-FM	91.5	WYOMING		
			Provo	KBYU-FM	88.9	Laramie	KUWR-FM	91.9
			Salt Lake City	KUER (FM)	90.1			

REMOTE SENSING

BENJAMIN F. RICHASON, JR.

C. Gerald Sanders and James R. O'Malley

A Georgia landscape

The accompanying photo is of a landscape in the Piedmont section of western Georgia at a scale of 1:7,920.¹ The terrain is moderately rolling and has a variety of vegetative covers reflecting cultural activities and land use, both past and present.

In general the climax vegetation of the region is mixed hardwoods with a few pines. The frequent occurrence of large areas of pine are indicative of previously cultivated land either planted to pine in conjunction with various agricultural programs (e.g., the so-called Soil Bank Program) or abandoned, leaving open field or pasture areas to the natural plant succession. Since pine species are not shade tolerant, they are unable to replace themselves in a canopied forest region. The

order of occurrence of trees in an abandoned field or pasture is first pine, then mixed pine-hardwood, and ultimately hardwood. Note the even stands of pine (dark tone) along the bottom edge of the photo. The lineation of the area planted is easily discernible. The tone and texture of the area planted to pine may be contrasted with the uneven character of the darker tones in other areas on the photo where pines became established by natural means.

In the upper center of the photo are two areas of cleared land where terracing is clearly evident. The lower of the two areas has numerous pines growing within the formerly cropped area and also has a dark line rimming the abandoned field indicating an encroachment of pine. Surrounding this area is an even-textured grey tone that identifies an area composed entirely of deciduous hardwood species. The upper of the two cleared areas is much lighter in tone, indicating a pasture; the presence of pines in the grazing area suggests that the pasture has been poorly maintained. Immediately above this light grey area is a splotchy pattern caused by pulp-size pines on a landscape where contours are faintly visible. Farming on this land was abandoned some 20 years earlier.

In this western Georgia region, a rectilinear land lot system divided the landholdings into squares of approximately

¹Agricultural Stabilization and Conservation Service Photo, A20, 13045, 172-149, 26 January 1972.

Professor Sanders and Professor O'Malley are members of the Department of Geography at West Georgia College in Carrollton.